# SARACO INDUSTRIES LIMITED

## EGERTON STREET, BOLTON

# NOISE IMPACT ASSESSMENT FOR PLANNING PURPOSES

**27 September 2023**

**AEC REPORT: P5048/R01/RDC**


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# 1.0 INTRODUCTION

1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Saraco Industries Limited to undertake a noise assessment in relation to the industrial development located off Egerton Street, Bolton.

1.2 This report details the baseline noise levels measured at the nearby noise sensitive receptors, presents the assessment criteria and discusses the implications on nearby receptors, as required by the Local Authority.

1.3 Acoustic terminology is discussed in brief in Appendix A.

# 2.0 BACKGROUND AND SITE DESCRIPTION

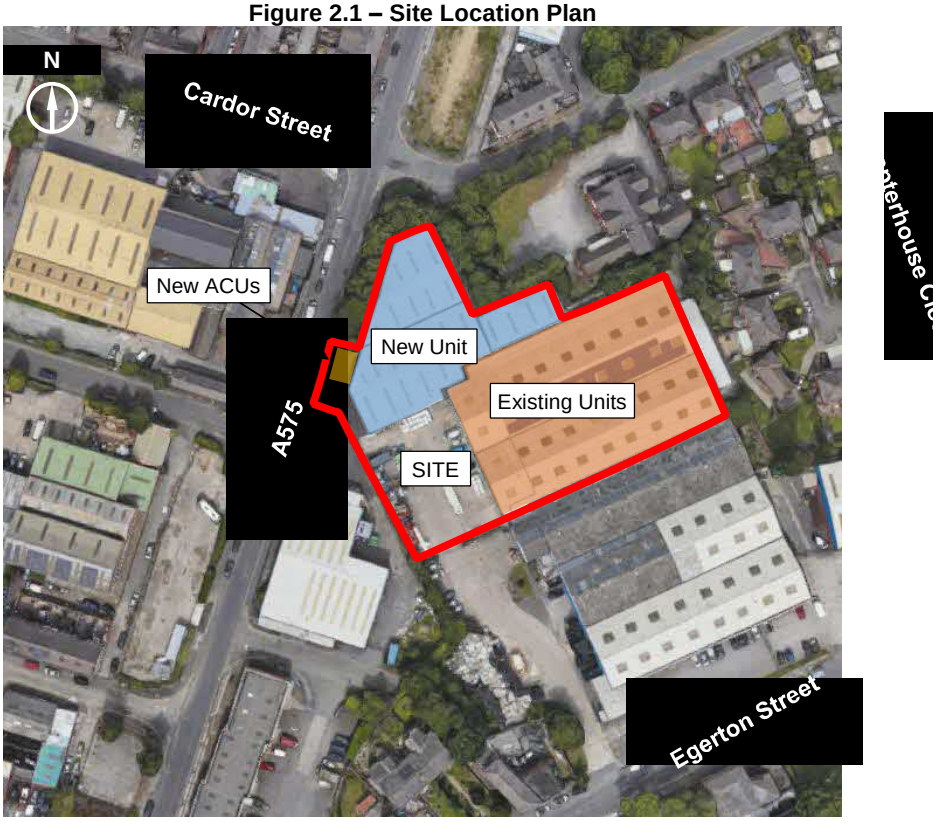
## Site Location

2.1 The proposed development is located off Egerton Street, Bolton. The development includes for a new storage and office unit that has been built on the existing Saraco Industries Site.

2.2 A site location plan is presented in Figure 2.1, below, which highlights the existing Saraco Industries units (orange) and the new unit (blue).

2.3 As part of the works, five new air conditioning units (ACU) have also been installed and their locations (yellow) are also highlighted.

**Figure 2.1 – Site Location Plan**




**Imagery @2023 Google, Imagery @2023 Infoterra Ltd & Bluesky, Maxar Technologies, The Geoinformation Group, Map Data @2023**

2.4 Saraco Industries Limited functions are a manufacturer of disposable wet wipes products. The new unit which is for storage only, operates between 0830 and 1730h, Monday to Friday and is closed at weekends.

2.5 Following discussions with the manufacturer and during on-site observations, it is understood that typically they receive approximately 10-15 HGV deliveries to the new storage unit within a full daytime period (0830 to 1730h). Therefore, on average there are two deliveries per hour. It was observed that deliveries typically lasted for 10 – 15 minutes.

2.6 It should be noted that the number of deliveries has not increased since the new storage unit was built. The changes only involve the location where materials and products are now stored.

2.7 Throughout a delivery, goods are unloaded from a HGV to the new storage unit with goods then being loaded back onto the HGV from the existing units. These operations are carried out with the use of electric forklift trucks (model number: Linde E16 EVO). It was observed that no more than two forklift trucks were used at any one time to load and unload the HGVs.

2.8 It was observed that no operations are undertaken internally within the storage unit, therefore, noise breakout via this element has not been discussed further.

2.9 The five ACUs are to provide ventilation to the new offices. Further information on their model numbers and their associated noise levels are shown in Section 3.0.

2.10 Based on the locations of the HGV / forklift activities and the items of plant, the nearest receptors to each would be the properties off Egerton Street to the south (approximately 65m away) and the properties off Cawdor Street to the north (approximately 75m away), respectively.

# 3.0 NOISE MEASUREMENTS

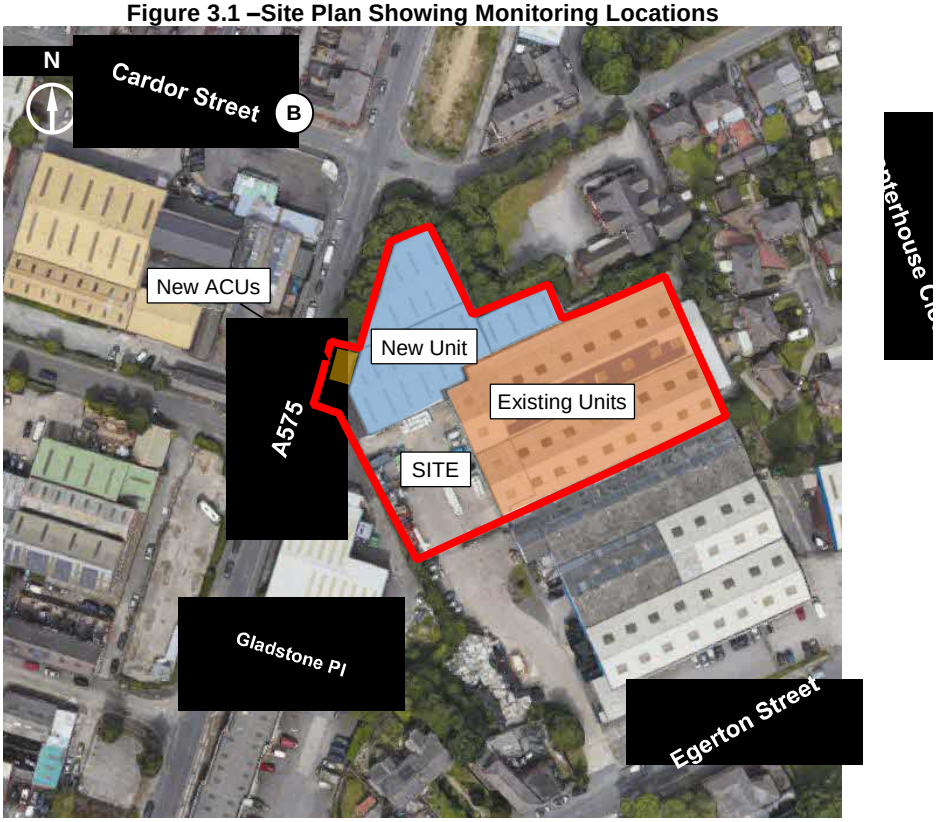
3.1 An attended noise level survey was undertaken by AEC between 0900 and 1120h on Monday 25 September 2023. Baseline noise levels, were measured at locations representative of the nearest noise sensitive receptors. Measurements were also undertaken of on-site operations including the unloading/loading of HGVs and of the ACUs. These measurements are discussed separately, below.

3.2 All measurements were undertaken under free-field conditions and in general accordance with BS7445-1: 2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'. A full measurement procedure for the survey is presented in Table B.1 of Appendix B.

**Baseline Noise Level Survey**

3.3 The background noise level measurement locations are identified as A and B on the attached Figure 3.1, below. These are representative of the Egerton Street and Cawdor Street receptors, respectively. The full measured data is presented in Table B.2 of Appendix B. Whilst Egerton Street is the nearer of the two receptors, a spot check measurement at Location B was carried out to determine if the background noise level was any lower at this location.

**Figure 3.1 –Site Plan Showing Monitoring Locations**




Imagery @2023 Google, Imagery @2023 Infoterra Ltd & Bluesky, Maxar Technologies, The Geoinformation Group, Map Data @2023

3.4 A summary of the daytime ambient, $dBL_{Aeq,T}$ and background, $dBL_{A90}$ noise levels are presented in Table 3.1, below.

**Table 3.1 – Summary of Measured Free-field Noise Levels**

| Measurement Location | Noise Levels, dB | |
|---|---|---|
| | Ambient, $L_{Aeq,T}$ | Background, $L_{A90,T}$ |
| A | 59 | 51 |
| B | 63 | 53 |

3.5 At both locations, ambient and background noise levels were mainly affected by road traffic on the A575. Occasional HGV arrivals into nearby industrial units contributed to the noise levels measurements at Location A. At Location B, noise levels were also partly affected by a nearby car wash off Cawdor Street.

### Site Operations Noise Level Survey

3.6 Following on-site discussions, the new storage unit operations include unloading materials / products from HGVs using electric forklifts. As previously stated, there are typically two HGV deliveries per daytime hour. No activities are undertaken inside the new unit and, therefore, this is not discussed further.

3.7 The unloading of a HGV lasted around 10 minutes and involved the use of two forklifts. A noise level of 66dB$L_{Aeq,T}$ was measured at 5m from the main noise sources during the entire operation of unloading the HGV. This level included the use of the forklift horns as well as forklift reversing alarms. In the absence of any operations taking place, ambient noise levels were approximately 62dB$L_{Aeq,T}$ and were due to operations associated with the existing industrial units in the area and distant road traffic.

3.8 During the site visit, none of the ACUs were operational. However, their model numbers were noted and this alongside their corresponding manufacturer noise level data has been presented in Table 3.2, below.

**Table 3.2 - ACU Model Numbers**

| Manufacturer | Model | No. of Units | Noise Level, dB | |
|---|---|---|---|---|
| | | | Sound Power, $L_{wA}$ | Sound Pressure, $L_{pA}$ |
| Panasonic | U-140PZH3E5 | 1 | 71 | 54 @ 1.5m |
| Panasonic | U-71PZ3E5A | 1 | 68 | 49 @ 1.5m |
| Panasonic | U-50PZ3E5 | 2 | 64 | 48 @ 1.5m |
| Panasonic | CU-BZ35XKE | 1 | - | 50 @ 1.5m |

# 4.0 BASIS OF ASSESSMENT

4.1 Noise from industrial and commercial Units is assessed using the methodology presented in BS4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound'* (BS4142).

4.2 BS4142 describes a method for determining the potential impact of sound from an industrial source on a noise sensitive receptor. For the purposes of BS4142, a noise source is assessed over a 1-hour period during the daytime (0700 and 2300h) and a 15-minute period at night (2300 and 0700h).

4.3 The impact of the source on the receptor is assessed by comparing the operational rating level with the background sound level without it operating.

4.4 A 'rating' noise level (dB$L_{Ar,Tr}$) is obtained by applying a character correction to the 'specific' noise level (dB$L_{Aeq,Tr}$). The correction is applied if the noise has a defined acoustic character such as being tonal, impulsive, distinctive, or intermittent in nature.

4.5 The term '*rating level*' is defined in BS4142 paragraph 9.1, which states:

"*Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:*

*a) Subjective method;*
*b) Objective method for tonality;*
*c) Reference method."*

4.6 The subjective method is based on an on-site assessment of the specific sound, in terms of the prominence of a specific tone or impulse or other character in the sound. A correction is applied based on the perception of the tonality and/or impulsivity (or other character) of the specific sound in comparison to the residual sound measured at the nearest noise sensitive receptor, the corrections to be applied are presented in Table 4.1, below.

**Table 4.1 – Perceptibility of Tonality & Impulsivity of Specific Sound Against Residual Sound**

| Perceptibility | Tonality | Impulsivity |
|---|---|---|
| None | 0 | 0 |
| Just | +2 | +3 |
| Clearly | +4 | +6 |
| Highly | +6 | +9 |

4.7 Where the specific sound has characteristics, which are neither tonal nor impulsive but are distinctive against the residual sound climate, a 3dB penalty can be applied. A 3dB penalty can also be applied if the specific sound is intermittent in nature.

4.8 BS4142 also notes that "*Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion*."

4.9 The impact of the source on the receptor is assessed by comparing the rating level during its normal operation with the background noise level when it is not operating.

4.10 The extent to which the rating level exceeds the background noise level determines the anticipated impact the noise source will have on nearby receptors. This is highlighted in BS4142 and is reproduced in Table 4.2, below.

**Figure 4.2 – Assessment of the Impacts**

| Scale | Magnitude of Rating Level over Background Noise Level, dB | BS4142 Comments* |
|---|---|---|
|  | > 10dB | The greater this difference, the greater the magnitude of the significant adverse impact. |
| | 10dB | Likely to be an indication of a significant adverse impact. |
| | 5dB | Likely to be an indication of an adverse impact. |
| | 0dB | Indication of a low impact. |
| | < 0dB | The lower the rating is below background, the greater the indication of a low impact. |

***Please note that these are dependent on the context of the site and noise source(s).**

4.11 Based on the above, by ensuring the noise from the proposed plant is controlled to not exceed the existing background noise level at the nearest noise sensitive receptor, this would give a good indication that there is a low impact.

# 5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

5.1 As stated above, the main source of noise during the on-site operations was from forklift movements associated with the unloading of HGVs.

5.2 Based on there being two deliveries per hour (each at 66dB$L_{Aeq,15min}$), the overall 1-hour noise level from this source would be approximately 64dB$L_{Aeq,1h}$ at 5m.

5.3 The determined specific noise level at each receptor based on the above noise source is presented in Table 5.1, below. Additionally, presented is a summary of the specific noise level determined from if all the items of plant were operating simultaneously based on their noise levels in Table 3.1 and appropriate distance attenuation.

**Table 5.1 – Determination of Specific Noise Levels**

| **Source** | **Egerton Street Receptor** | **Cawdor Street Receptor** |
|---|---|---|
| HGV / Forklift Operations | 64dB$L_{Aeq,1h}$ at 5m | |
| Distance Attenuation | -22dB (-20*log(5/65) | -26dB (-20*log(5/95) |
| **Summary** | **44dB$L_{Aeq,Tr}$** | **40dB$L_{Aeq,Tr}$** |
| Plant Items | 58dB$L_{Aeq,1h}$ at 1.5m | |
| Distance Attenuation | -33dB (-20*log(1.5/70) | -36dB (-20*log(1.5/100) |
| **Summary** | **25dB$L_{Aeq,Tr}$** | **22dB$L_{Aeq,Tr}$** |
| **TOTAL Specific Noise Level** | **44dB$L_{Aeq,Tr}$** | **40dB$L_{Aeq,Tr}$** |

5.4 Based on the above noise breakout from the plant items is significantly below the HGV / forklift operations.

5.5 Using the specific noise levels determined above for the two noise sources, BS4142 assessments have been carried out in Tables 5.2 and 5.3, below, for the Egerton Street and Cawdor Street receptors, respectively.

**Table 5.2 – BS4142 Assessment – Egerton Street**

| Details | Level | Commentary |
|---|---|---|
| Measured Ambient Sound Level, $L_{Aeq,T}$ | $L_{Aeq}$ = 59 dB | Specific sound source not operating. |
| Measured Background Sound Level, $L_{A90}$ | $L_{A90\ (1h)}$ = 51 dB | Specific sound source not operating. |
| TOTAL Specific Sound Level | $L_{Aeq\ (1h)}$ = 44 dB | Calculated based on all sources operating during a typical 1-hour period. |
| Acoustic feature correction | +3 dB | Due to the intermittent nature of the HGV and forklift movements it is considered an acoustic feature correction of +3dB would be appropriate. |
| Rating Level, $L_{Ar,Tr}$ | (44 + 3) dB = 47 dB | |
| Background Sound Level, $L_{A90}$ | $L_{A90\ (1\ h)}$ = 51 dB | |
| Excess of rating over background sound level | (47 - 51) dB = -4 dB | Assessment indicates that the source would have a low impact, depending on context |
| Uncertainty of the assessment | Not significant | As the rating level is 4dB below the existing background noise level, this allows for some degree of tolerance and, therefore, should account for any potential uncertainty. Potentially this could account for a doubling of deliveries per hour. |

**Table 5.3 – BS4142 Assessment – Cawdor Street**

| Details | Level | Commentary |
|---|---|---|
| Measured Ambient Sound Level, $L_{Aeq,T}$ | $L_{Aeq}$ = 63 dB | Specific sound source not operating. |
| Measured Background Sound Level, $L_{A90}$ | $L_{A90\ (1h)}$ = 53 dB | Specific sound source not operating. |
| TOTAL Specific Sound Level | $L_{Aeq\ (1h)}$ = 40 dB | Calculated based on all sources operating during a typical 1-hour period. |
| Acoustic feature correction | +3 dB | Due to the intermittent nature of the HGV and forklift movements it is considered an acoustic feature correction of +3dB would be appropriate. |
| Rating Level, $L_{Ar,Tr}$ | (40 + 3) dB = 43 dB | |
| Background Sound Level, $L_{A90}$ | $L_{A90\ (1\ h)}$ = 53 dB | |
| Excess of rating over background sound level | (43 - 53) dB = -10 dB | Assessment indicates that the source would have a low impact, depending on context. |
| Uncertainty of the assessment | Not significant | As the rating level is 10dB below the existing background noise level, this allows for some degree of tolerance and, therefore, should account for any potential uncertainty. |

5.6 Based on the BS4142 assessments presented above, the determined rating noise level due to site operations is below the measured background noise level external to the nearest noise sensitive receptors on Egerton Street or Cawdor Street.

5.7 Therefore, in accordance with BS4142 noise from the proposed development would have a low impact on nearby receptors.

5.8 Based on the above, AEC are satisfied that the above assessment indicates that noise from the new unit is appropriately controlled to any nearby receptors and should not cause an adverse impact.

# APPENDIX A – Acoustic Terminology in Brief

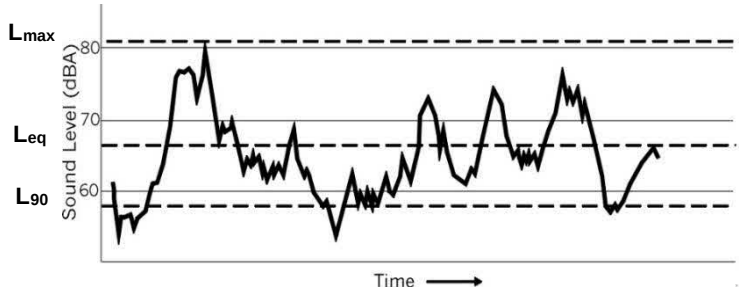
## General

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz *(Hz)*, that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discreet frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA,* normally used to assess the effect of noise on people. The dBA weighting emphasizes or reduces the importance of certain frequencies within the audible range

## Sound / Noise Units

The figure below shows an example of sound level varying with time. Because of this variation over time the same period of noise can be described by several different levels. The most common of these are described below.




| Commonly Used Descriptors for Sound / Noise | |
|---|---|
| **$L_{Aeq,T}$** | The equivalent continuous (A-weighted) sound level. It may be thought of as the "average" sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises. **It can be considered as the "ambient" noise level.** |
| **$L_{A90,T}$** | The (A-weighted) sound level exceeded for 90% of a measurement period. **It is the value often used to describe the "background" noise.** |
| **Free-field Level** | This refers to the sound level measured outside, away from reflecting surfaces. |
| **Ambient Sound Level, $L_{Aeq,T}$** | Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T. |
| **Background Sound Level, $L_{A90}$** | A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels. |
| **Rating Level, $L_{Ar,Tr}$** | Specific sound level plus any adjustment for the characteristic features of the sound |
| **Residual Sound, $L_{Aeq,T}$** | Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound. |
| **Specific Sound Level, $L_{Aeq,Tr}$** | Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, $_r$. |

# APPENDIX B – Noise Survey Details

**Table B.1 – Environmental Measurement Procedure**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Date & Time of Survey:** | 0900 to 1120h on Monday 25 September 2023. | | | | | |
| **Personnel:** | Ross Chamberlain (AEC). | | | | | |
| **Equipment Used:** | Cirrus CR:171B Real Time Analyser (AEC Kit 5) | | | | | |
| **Calibration:** | The sound level analysers, which conforms to BS EN 61672-1: 2013 *'Electroacoustics – Sound level meters - Part 1 Specifications'* for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request. | | | | | |
| **Weather Conditions:** | **Date** | **Period** | **Wet/Dry** | **Temp**°C | **Wind Speed & Direction** | **Cloud Cover** |
| | 25.09.23 | Day | Dry | 14°C | 5mph easterly | 50% |
| **Measurement Locations:** | Measurements were undertaken at two locations around the development site. Identified as A and B on Figure 3.1.<br><br>A – Located at the end of Gladstone Place.<br>B – Located off Cardor Street.<br><br>Additional measurement locations were also chosen to measure site operations. | | | | | |
| **Measurement Details:** | Measurements were undertaken over various periods in terms of $L_{eq}$, $L_{90,}$ and $L_{max}$. | | | | | |
| **Façade / Free-Field:** | A & B - free-field. | | | | | |
| | Full results for the attended measurements are given in Tables B.2 and B.3. | | | | | |
| **Measured Data:** | Full octave band centre frequency data was obtained for all measurements. | | | | | |

**Table B.2 – Measured Daytime Noise Levels**

| Location | Period, h | Noise Level, dB | | | Comments |
|---|---|---|---|---|---|
| | | $L_{Aeq}$ | $L_{A90}$ | $L_{Amax, F}$ | |
| A | 0900 – 0915 | 58.8 | 50.9 | 75.8 | Ambient and background noise levels due to road on the A575 and distant road traffic in the area. Occasional noise levels from HGV arrivals to the industrial units in the area. |
| | 0920 – 0935 | 58.7 | 51.3 | 73.4 | |
| | 0940 - 0955 | 60.3 | 51.9 | 76.6 | |
| B | 0957 - 1007 | 62.7 | 53.3 | 79.1 | Ambient and background noise levels due to road on the A575 and distant road traffic in the area. Noise from the nearby car wash on Egerton Street did also affect the measurements but to a lesser extent. |

**Table B.3 – Measured Night-Time Noise Levels**

| Operation | Period, h | Noise Level, dB | | Comments |
|---|---|---|---|---|
| | | $L_{Aeq}$ | $L_{Amax, F}$ | |
| Forklift Reversing | 11s | 63.0 | 70.2 | Noise level at 5m. |
| HGV Manoeuvring | 55s | 72.0 | 83.5 | Noise level at 15m. |
| HGV Unloading with Forklifts | 1101 - 1109 | 66.3 | 85.8 | Noise level at 5m. |